REMARKS:

Claims 1-3 are pending in the application. Claims 1-3 were rejected under 35 U.S.C. § 103. Claim 1 is the only independent claim.

The abstract has been amended to place the application in correct idiomatic English. The claims have been amended to place the claims in better U.S. form without narrowing the scope of the claims as originally presented. Attached hereto is a marked-up version of the changes made to the claims and abstract by the current amendment. The attachment is caption "**Version with Markings to Show Changes Made**."

Applicants respectfully traverse the rejection of claims 1-3 under 35 U.S.C. § 103, for the following reasons.

The present invention relates to an excimer laser or electric discharge gas laser comprising a magnetic bearing device which is adapted to support a shaft of a rotating fan provided in a laser housing to circulate a gas in the housing. Specifically, the present invention is directed to an excimer laser comprising a magnetic bearing device which ensures easy replacement of a magnetic bearing mechanism or a control device of the laser.

A conventional excimer laser, for example as described with respect to Figs. 1 and 2 on pages 1-4 of the above-identified application, includes a laser body 10 and a control device 20. In the conventional apparatus, a signal processing circuit 21 processes position indicating signals from displacement sensors for use in controlling a magnetic floating support of a shaft and is contained in the control device 20. That is, a mechanism for adjustment of the sensitivity is located in the control device. Therefore, when replacement of either a magnetic bearing mechanism body or a control device is conducted, an operation for re-adjustment is necessary for enabling the signal processing circuit to have properties suitable for the bearing mechanism body.

In order to reduce such an operation for re-adjustment, there has been employed a technique in which variations in manufacturing tolerances or variation in material properties of the bearing mechanism bodies are minimized at the time of completion of assembly, so as to prevent variations in outputs of the displacement sensors. With such a technique, there is no apparent difference between individual bearing mechanism bodies.

However, a difference between individual bearing mechanism bodies can not be completely eliminated by the conventional technique. In practice, it is only possible to minimize such a difference by putting tolerances of individual parts under highly strict control and suppressing dimensional tolerances generated in the course of assembly to a level within a predetermined allowable range. In addition, a selection operation is necessary and assembled parts having tolerances exceeding beyond the allowable range are subjected to additionally processing or disposal, thereby lowering a yield. This makes it difficult to achieve an appropriate level of cost reduction which should normally result from mass production.

In accordance with the present invention, an excimer laser or electric discharge gas laser includes a mechanism for adjusting displacement sensors provided in a magnetic bearing mechanism body, which enables a difference between individual bearing mechanism bodies to be eliminated in design terms by means of the adjustment mechanism, and which ensures easy replacement of either the magnetic bearing mechanism body or a control device, to thereby achieve a reduction in cost of the entire system. Because the signal processing circuit is arranged in the magnetic bearing mechanism body in accordance with the present invention, variations in signals delivered from displacement sensors due to manufacturing errors of the bearing mechanism bodies can be adjusted to a predetermined level at a manufacturing stage. Further, it is possible to conduct initial adjustments of various properties of the magnetic bearing mechanism body so that there is no difference between individual bearing mechanism bodies in terms of a control device for controlling magnetic floating support of the bearing mechanism body. When either the bearing mechanism body or the control device is replaced, it is unnecessary to conduct adjustments in the control device.

Independent claim 1 requires an electric discharge gas laser comprising a housing, a rotating fan provided in the housing, a bearing device including a sensor device and a signal processor, and a control separated from the bearing device. As discussed above, and in the background of the invention on pages 1-4 of the above-identified application, the signal processing circuit of the conventional laser is in the control device and separated from the laser body. On the contrary, the signal processing circuit as required in independent claim 1 is included in the bearing device and separated from the control.

A

Page 2 of the Office Action asserts that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the [conventional] excimer laser [discussed with respect to Figs. 1 and 2] with the integration of the signal processor to the bearing device, since it has been held that forming in one piece an article which has formerly been formed in two pieces and putting together involves only routine skill in the art. The Office Action then cites *Howard v. Detroit Stove Works*, 150 U.S. 164 (1863).

The *Howard* case was drawn to an infringement suit involving 3 patents of various components of stoves. The Court in *Howard* found that the second patent was void because the bolting or riveting together of sections of a stove was well known at the time of the invention, and the use of lugs with holes perforated through them was anticipated in other stoves and furnaces manufactured many years prior to the date of the patent. In particular, the Court stated that "the general form of the fire-pot is the same as in the former patent, including the internal flange, which, is alleged, now performs a triple function vis.: collecting ashes, as before; supporting the grate, as before, and securing the ash-pit to the fire-pot by means of bolts or rivets passing through the holes in the flange." Id at 168. The court further stated that the claims, "in view of the state of the art, limited the novelty to the use of the bolts and rivets, and it is too plain for discussion, or the citation of authorities, that this does not involve invention." Id.

It is respectfully submitted that including the signal processing circuit with the magnetic bearing mechanism body, as required in claim 1, is not limiting the "novelty to the use of bolts and rivets."

MPEP § 2144.04 discusses the legal precedent as a source of supporting a rationale for a motivation to modify a reference to support a rejection under 35 U.S.C. § 103.

With respect to making integral, MPEP § 2144.04 (V)(B) discusses *Schenck v. Nortron Corp.*, 713 F.2d 782, 218 USPQ 698 (Fed. Cir. 1983). In *Schenck*, the claims were directed to a vibratory testing machine comprising a holding structure, a base structure, and a supporting means which form "a single integral and gapelessly continuous piece." Nortron argued that the invention is just making integral what had been made in four bolted pieces. The court found this argument unpersuasive and held that the claims were patentable because the prior art perceived a need for

A

mechanisms to dampen resinous, whereas the inventor eliminated the need for dampening via the one-piece gapeless support structure, showing insight that was contrary to the understandings and expectations of the art.

In light of *Schenck*, it is respectfully submitted that claim 1 is patentable over the cited conventional art because of the reasons discussed above. In particular, the conventional art perceived a need to keep the signal processing circuit separated from the laser body to ensure easy replacement of a magnetic bearing mechanism body or the control device. On the contrary, the present invention, by including the signal processing circuit with the bearing device, eliminates a need for re-adjustment to enable the signal processing circuit to have properties suitable for the replaced bearing mechanism body.

In view of the above remarks, Applicants respectfully submit that claims 1-3 would not have been obvious over the conventional art discussed with respect to Figs. 1 and 2, and urge that the rejection of claims 1-3 under 35 U.S.C. § 103 be withdrawn.

Having fully and completely responded to the Office Action, Applicants submit that all of the claims are now in condition for allowance, an indication of which is respectfully solicited.

If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicants' attorney at the telephone number shown below.

Respectfully submitted,

Atushi OOYAMA et al.

By: Thomas D Robbins

Thomas D. Robbins
Registration No. 43,369
Attorney for Applicants

TDR/abm
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
December 23, 2002

A

WHAT IS CLAIMED IS:

1. An electric discharge gas laser comprising:

a housing containing a gas ~~used for~~ generating a laser beam;

a rotating fan provided in ~~the~~ housing to circulate the gas in ~~the~~ housing, ~~the~~ rotating fan having a rotating shaft;

a bearing device ~~for~~ magnetically ~~supporting~~ the shaft ~~of the rotating fan~~ in a floating condition, ~~the~~ bearing device ~~being provided with~~ a sensor device comprising a sensor ~~for sensing~~ the position of ~~the~~ rotating shaft relative to ~~the~~ bearing device to generate signals indicating the position of ~~the~~ rotating shaft, and a signal processor ~~for receiving~~ and ~~processing~~ the signals delivered from ~~the~~ sensor to output processed signals; and

a control separated from ~~the~~ bearing device and functionally associated with ~~the~~ bearing device to receive the processed signals from ~~the~~ sensor device for controlling ~~the~~ bearing device on the basis of the processed signals.

2. An electric discharge gas laser as set forth in claim 1 ~~in which:~~

said signal processor ~~processing~~ the signals delivered from ~~the~~ sensor so as to output the processed signals at a predetermined level of ~~sensing sensibility~~ of ~~the~~ sensor device.

3. An electric discharge gas laser as set forth in claim 2 ~~in which:~~

said signal processor includes a circuit ~~for~~ generating and delivering signals indicating a displacement of ~~rotation~~ shaft from a target position thereof on the basis of the signals delivered from ~~the~~ sensor and a gain controllable amplifier ~~for adjusting~~ an amplitude of the signals delivered from ~~the above-noted~~ circuit.

ELECTRIC DISCHARGE GAS LASER

ABSTRACT OF THE DISCLOSURE

There is provided an electric discharge gas laser comprising a housing containing a laser gas, a rotating fan is provided in the housing to circulate the gas in the housing, a bearing device for magnetically supporting a rotating shaft of the rotating, the bearing device being provided with a sensor device comprising a sensor for sensing the position of the rotating shaft to generate signals indicating the position of the rotating shaft, and a signal processor for receiving and processing the signals delivered from the sensor to output processed signals, and a control separated from the bearing device and functionally associated with the bearing device to receive the processed signals from the sensor device for controlling the bearing device on the basis of the processed signals.